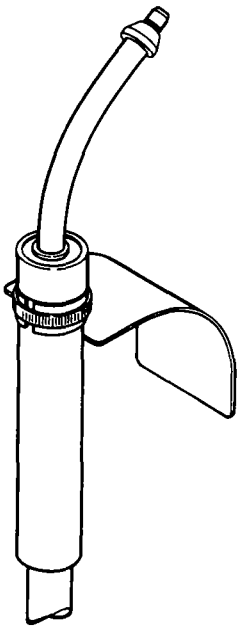
July 1988 FORM: OM-1532A
Effective With Style No. JA-9

Miller®

MODEL
GA-50GL



OWNER'S MANUAL

IMPORTANT: Read and understand the entire contents of both this manual and the power source manual used with this unit, with special emphasis on the safety material throughout both manuals, before installing, operating, or maintaining this equipment. This unit and these instructions are for use only by persons trained and experienced in the safe operation of welding equipment. Do not allow untrained persons to install, operate, or maintain this unit. Contact your distributor if you do not fully understand these instructions.

Miller Electric Mfg. Co.
A Miller Group Ltd. Company

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Appleton, WI 54912 USA
Tel. 414-734-9821

PRINTED IN U.S.A.

ADDITIONAL COPY PRICE 25 CENTS

LIMITED WARRANTY

EFFECTIVE: FEBRUARY 16, 1988

This warranty supersedes all previous MILLER warranties and is exclusive with no other guarantees or warranties expressed or implied.

LIMITED WARRANTY - Subject to the terms and conditions hereof, Miller Electric Mfg. Co., Appleton, Wisconsin warrants to its Distributor/Dealer that all new and unused Equipment furnished by Miller is free from defect in workmanship and material as of the time and place of delivery by Miller. No warranty is made by Miller with respect to engines, trade accessories or other items manufactured by others. Such engines, trade accessories and other items are sold subject to the warranties of their respective manufacturers, if any . All engines are warranted by their manufacturer for one year from date of original purchase, except Tecumseh engines which have a two year warranty.

Except as specified below, Miller's warranty does not apply to components having normal useful life of less than one (1) year, such as spot welder tips, relay and contactor points, MILLERMATIC parts that come in contact with the welding wire including nozzles and nozzle insulators where failure does not result from defect in workmanship or material.

Miller shall be required to honor warranty claims on warranted Equipment in the event of failure resulting from a defect within the following periods from the date of delivery of Equipment to the original user:

1. Arc welders, power sources, robots, and components . 1 year
2. Load banks ..... 1 year
3. Original main power rectifiers ..... 3 years (labor - 1 year only)
4. All welding guns, feeder/guns and torches ..... 90 days
5. All other Millermatic Feeders ..... 1 year
6. Replacement or repair parts, exclusive of labor .. 60 days
7. Batteries ..... 6 months

provided that Miller is notified in writing within thirty (30) days of the date of such failure.

As a matter of general policy only, Miller may honor claims submitted by the original user within the foregoing periods.

In the case of Miller's breach of warranty or any other duty with respect to the quality of any goods, the exclusive remedies therefore shall be, at Miller's option (1) repair or (2) replacement or, where authorized in writing by Miller in appropriate cases, (3) the reasonable cost of repair or replacement at an authorized Miller service station or (4) payment of or credit for the purchase price (less reasonable depreciation based upon actual use) upon return of the goods at Customer's risk and expense. MILLER's option of repair or replacement will be F.O.B., Factory, at Appleton, Wisconsin, or F.O.B., at a MILLER authorized service facility, therefore, no compensation for transportation costs of any kind will be allowed. Upon receipt of notice of apparent defect or failure, Miller shall instruct the claimant on the warranty claim procedures to be followed.

ANY EXPRESS WARRANTY NOT PROVIDED HEREIN AND ANY IMPLIED WARRANTY, GUARANTY OR REPRESENTATION AS TO PERFORMANCE, AND ANY REMEDY FOR BREACH OF CONTRACT WHICH, BUT FOR THIS PROVISION, MIGHT ARISE BY IMPLICATION, OPERATION OF LAW, CUSTOM OF TRADE OR COURSE OF DEALING, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR PARTICULAR PURPOSE, WITH RESPECT TO ANY AND ALL EQUIPMENT FURNISHED BY MILLER IS EXCLUDED AND DISCLAIMED BY MILLER.

EXCEPT AS EXPRESSLY PROVIDED BY MILLER IN WRITING, MILLER PRODUCTS ARE INTENDED FOR ULTIMATE PURCHASE BY COMMERCIAL/INDUSTRIAL USERS AND FOR OPERATION BY PERSONS TRAINED AND EXPERIENCED IN THE USE AND MAINTENANCE OF WELDING EQUIPMENT AND *NOT* FOR CONSUMERS OR CONSUMER USE. MILLER'S WARRANTIES DO NOT EXTEND TO, AND NO RESELLER IS AUTHORIZED TO EXTEND MILLER'S WARRANTIES TO, ANY CONSUMER.

April 27, 1990 FORM: OM-1532A

ERRATA SHEET

After this manual was printed, refinements in equipment design occurred. This sheet lists exceptions to data appearing later in this manual.

AMENDMENT TO PARTS LIST

Amend Parts List as follows:

All Parts Eff w/KA27

**	Part No.	Replaced With	Description	Quantity
7-5	008 931	Deleted		
7-13	602 177	602 178	SCREW, set stl sch .250-20 x .375	1
7-17	079 856	134 601	SLEEVE, centering monocoil	1
7-18	079 852	134 600	GUIDE, wire outlet 1/16-5/64	1
7-26	009 624	114 974	LINER, monocoil 1/16-5/64 wire x 11ft 6in	1
7-26	009 625	114 973	LINER, monocoil 1/16-5/64 wire x 16ft 8in	1

**First digit represents page no - digits following dash represent item no.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

SECTION 1 – INTRODUCTION

Rating: 100% Duty Cycle, dcrp	Wire Diameter	Cable Length	Cooling Method	Net Weight	Ship Weight
500 Amperes	1/16 thru 1/8 in. (1.6 thru 3.2 mm)	10 ft. (3.0 m) 15 ft. (4.6 m)	Air Air	12 lbs. (5.4 kg) 14 lbs. (6.4 kg)	14 lbs. (6.4 kg) 16 lbs. (7.3 kg)

Figure 1-1. Specifications

1-1. GENERAL INFORMATION AND SAFETY

A. General

Information presented in this manual and on various labels, tags, and plates on the unit pertains to equipment design, installation, operation, maintenance, and troubleshooting which should be read, understood, and followed for the safe and effective use of this equipment.

B. Safety

The installation, operation, maintenance, and troubleshooting of arc welding equipment requires practices and procedures which ensure personal safety and the safety of others. Therefore, this equipment is to be installed, operated, and maintained only by qualified persons in accordance with this manual and all applicable codes such as, but not limited to, those listed at the end of Section 1 - Safety Rules For Operation Of Arc Welding Power Source in the welding power source Owner's Manual.

Safety instructions specifically pertaining to this unit appear throughout this manual highlighted by the signal words WARNING and CAUTION which identify different levels of hazard.

WARNING statements include installation, operation, and maintenance procedures or practices which if not carefully followed could result in serious personal injury or loss of life.

CAUTION statements include installation, operation, and maintenance procedures or practices which if not carefully followed could result in minor personal injury or damage to this equipment.

A third signal word, IMPORTANT, highlights instructions which need special emphasis to obtain the most efficient operation of this equipment.

1-2. RECEIVING-HANDLING

Before installing this equipment, clean all packing material from around the unit, and carefully inspect for any damage that may have occurred during shipment. Any claims for loss or damage that may have occurred in transit must be filed **by the purchaser with the carrier.** A copy of the bill of lading will be furnished by the manufacturer on request if occasion to file claim arises.

When requesting information concerning this equipment, it is essential that Model Description and Style Number of the equipment be supplied.

1-3. DESCRIPTION

This gun is designed specifically for use in conjunction with the self-shielding Flux Cored Arc Welding process. The gun is shipped with the necessary components for the specific wire size ordered. Through minor changes in parts the gun may be used with 1/16, .068/.072, 5/64, 3/32, 7/64, or 1/8 in. (1.6, 1.8, 2.0, 2.4, 2.8, or 3.2 mm) flux cored wire. The GA-50GL is designed for semiautomatic scratch start open arc welding.

An optional had-held flux hopper extends the capabilities to include manual Submerged Arc Welding. The alpha-numeric designation refers to the following:

G - gun
A - air cooled
50 - ampere rating: 500 ampere
GL - gasless

SECTION 2 – INSTALLATION

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source and disconnect input power employing "lockout/tagging procedures" before installing gun.*

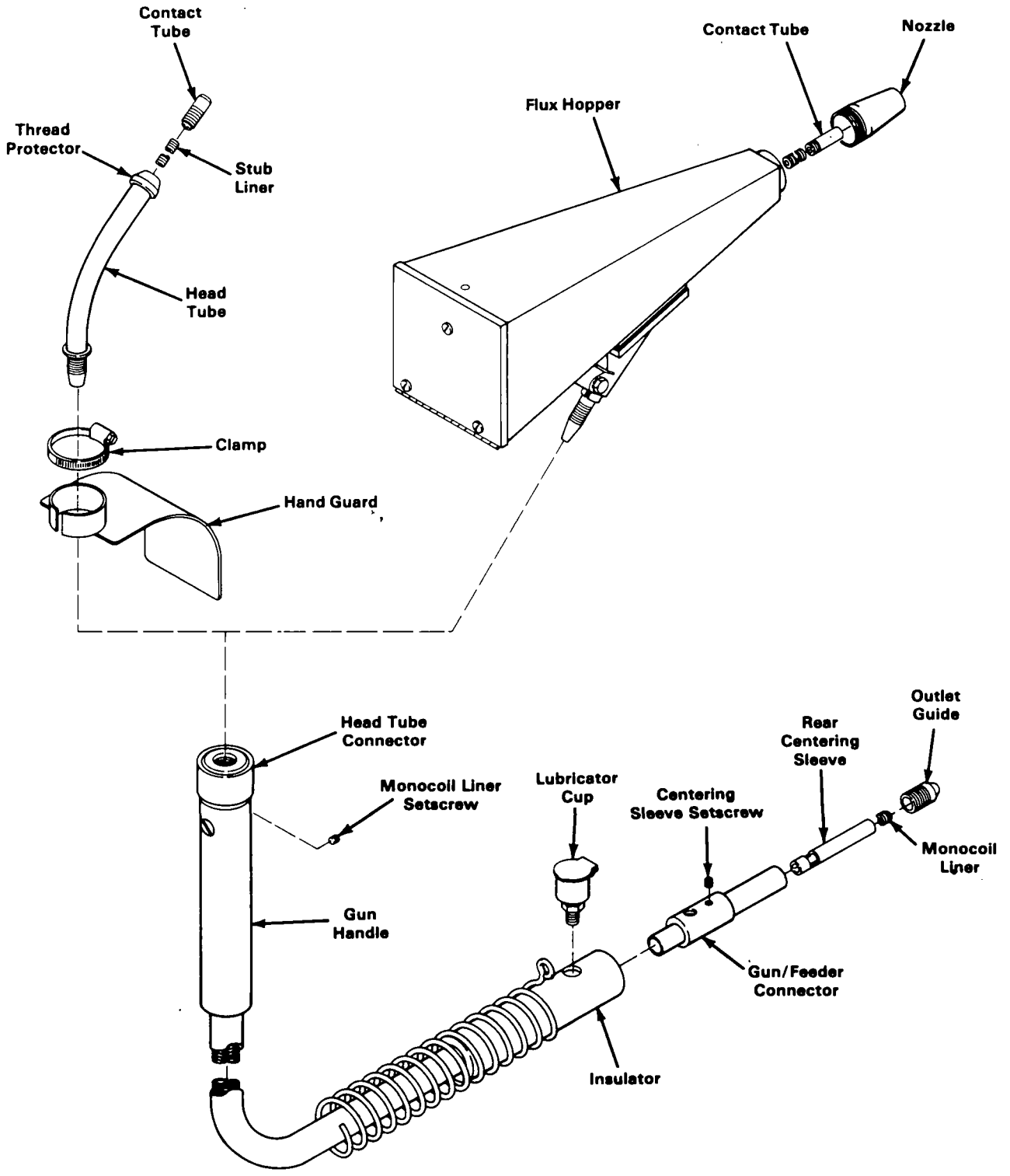
Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

2-1. GUN/FEEDER CONNECTOR INSTALLATION (Figure 2-1)

Proceed as follows to install the gun/feeder connector into the drive assembly on the wire feeder.

IMPORTANT: *The outlet guide is provided as part of the gun assembly.*

1. Loosen the gun/feeder connector securing knob on the wire drive assembly.



TC-044 585

Figure 2-1. Gun Components

IMPORTANT: *The outlet guide should be positioned as close as possible to the drive rolls without touching them. This gives the wire maximum column strength thus eliminating waves.*

2. Insert the gun/feeder connector into the wire drive assembly.
3. Tighten the gun/feeder connector securing knob.

2-2. NOZZLE (Optional)

A 1-3/4 in. (44.5 mm) nozzle is recommended for normal application. If longer stick out of the electrode is desired, a 2-3/8 in. (60 mm) nozzle is available. The gun is shipped with a thread protector which should be used when a nozzle is not.

2-3. INSTALLATION OF HAND-HELD FLUX HOPPER (Optional) (Figure 2-1)

1. Remove the head tube.
2. Loosen the clamp securing the hand guard, and remove the hand guard.
3. Install hand-held flux hopper assembly into head tube connector.

2-4. INSTALLATION OF TRIGGER SWITCH (Optional)

IMPORTANT: *The installation of trigger switch adapts the GA-50GL gun for use with any feeder requiring a switch-type starting system.*

1. Position the trigger switch on the gun handle and secure with supplied clamp.
2. Insert the amphenol gun switch plug into the switch control receptacle on the wire feeder. Rotate the plug collar clockwise to lock plug in receptacle.

SECTION 3 – SEQUENCE OF OPERATION

3-1. DUTY CYCLE

The duty cycle of a welding gun is the percentage of a ten minute period that a gun can be operated at a given output. This gun is rated at 100 percent duty cycle. This means that the gun can be operated at rated load continuously.

CAUTION: EXCEEDING DUTY CYCLE RATING will damage the welding gun.

- *Do not exceed rated duty cycle.*

3-2. FLUX CORED AND MANUAL SUBMERGED ARC WELDING

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source and wire feeder, and disconnect gun before handling or replacing any gun parts.*
- *When not in use, store the gun in insulated holder so wire cannot be touched or make contact with metal surfaces.*
- *Wear dry insulated gloves or use insulated tools when cutting wire.*

The welding wire and all metal parts in contact with it are electrically hot whenever the wire feeder is connected to an energized welding power supply.

ARC RAYS, SPARKS, AND HOT SURFACES can burn eyes and skin; NOISE can damage hearing.

- *Wear correct eye, ear, and body protection.*

FUMES AND GASES can seriously harm your health.

- *Use enough ventilation to keep fumes and gases from the breathing zone.*

See Section 1 – Safety Rules For Operation Of Arc Welding Power Source in welding power source Owner's Manual for basic welding safety information.

1. Ensure that proper electrical connections have been made to the welding power source and the wire feeder.
2. Ensure that the welding wire has been properly threaded and that correct initial tension has been set on the drive rolls (refer to the wire feeder Owner's Manual).
3. Fill hand-held flux hopper, if applicable.
4. Place control(s) on wire feeder in the desired position for the welding setup.
5. Place the controls on the welding power source in the desired position for the welding setup (refer to welding power source Owner's Manual).
6. Energize the welding power source and wire feeder (refer to the respective Owner's Manuals).

WARNING: ELECTRIC SHOCK can kill; WELDING WIRE can cause puncture wounds.

- *Do not touch live electrical parts.*
- *Do not point gun toward any part of the body, any conductive surface, or other personnel when threading welding wire.*

The welding wire and all metal parts in contact with it are energized while the welding power source is energized.

7. Actuate jog switch or optional Trigger Switch, if applicable, to run the wire out beyond the end of the contact tube. Cut the wire off so it sticks out approximately 1/2 to 3/4 in. (13 to 19 mm) from the nozzle or hand-held flux hopper nozzle, if applicable.
8. Hold end of nozzle approximately 1 in. (25 mm) from workpiece.
9. Touch welding wire to workpiece or press optional Trigger Switch, if applicable, to start wire feed; an arc will be established. If wire slippage is noticed, tighten drive roll pressure adjustment 1/4 turn at a time until slippage stops. Do not overtighten.
10. After the controls on the welding power source and wire feeder are adjusted for normal operation, they will function automatically whenever the welding wire touches the workpiece or the optional Trigger Switch is depressed. Removing welding wire from workpiece or releasing the Trigger Switch, if applicable, will break the arc and cause wire feeder to stop.

3-3. SHUTTING DOWN

1. Stop welding (remove wire from workpiece).
2. Turn off welding power source and wire feeder.

SECTION 4 – MAINTENANCE

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source and wire feeder and disconnect gun before handling or replacing any gun parts.*
- *When not in use, store the gun in insulated holder so wire cannot be touched or make contact with metal surfaces.*
- *Wear dry insulated gloves or use insulated tools when cutting wire.*

HOT SURFACES can cause severe burns.

- *Allow cooling period before servicing.*

The welding wire and all metal parts in contact with it are electrically hot whenever the wire feeder is connected to an energized welding power supply.

4-1. INSPECTION AND UPKEEP

Usage and shop conditions will determine frequency and type of maintenance required.

1. Inspect gun for broken area, cracks and loose parts; tighten, repair, and replace as required.
2. Carefully remove any weld spatter or foreign matter which may accumulate around the nozzle orifice.
3. Remove any accumulation around the Trigger Switch, if applicable.
4. Repair or replace as required all cables; give particular attention to frayed and cracked insulation and areas where it enters equipment.
5. Remove grease and grime from components; moisture from electrical parts and cables.

4-2. CONTACT TUBE REPLACEMENT (Figure 2-1)

1. Remove nozzle.
2. Cut off any portion of the electrode wire which extends beyond end of contact tube.
3. Remove contact tube and replace with new contact tube.
4. Replace nozzle and resume operation.

4-3. CHANGING WIRE SIZES (Figure 2-1)

WARNING: ELECTRIC SHOCK can kill.

- *Do not touch live electrical parts.*
- *Shut down welding power source and disconnect input power employing "lockout/tagging procedures" before installing gun.*

Lockout/tagging procedures consist of padlocking line disconnect switch in open position, removing fuses from fuse box, or shutting off and red-tagging circuit breaker or other disconnecting device.

- *Disconnect gun from feeder before inspecting or servicing.*

Each time the size of the electrode wire is changed, it is necessary to change the contact tube.

IMPORTANT: *The contact tube has right-hand threads.*

When changing to 1/16, .068/.072, or 5/64 in. (1.6, 1.8, or 2.0 mm) wire from any other size, it is necessary to change the monocoil liner, the outlet wire guide, and add a rear centering sleeve (see parts list).

When changing from 1/16, .068/.072, or 5/64 in. (1.6, 1.8, or 2.0 mm) wire to any other size, it is necessary to

change the monocoil liner, the outlet wire guide, and remove the rear centering sleeve.

To change the liner and wire guide and add or remove the centering sleeve, proceed as follows:

1. Remove nozzle or thread protector, as applicable.
2. Remove head tube or optional hand-held flux hopper.
3. Loosen clamp securing hand guard, and slide hand guard back on gun handle to gain access to monocoil liner setscrew.
4. Loosen the monocoil liner setscrew.
5. Remove the lubricator cup.
6. Remove the outlet wire guide.
7. Lay the gun out flat (no coils in cable/conduit).

IMPORTANT: *3/32, 7/64, or 1/8 in. (2.4, 2.8, or 3.2 mm) liners may be pulled out from either end. 1/16, .068/.072, or 5/64 in. (1.6, 1.8, or 2.0 mm) liners must be pulled out from the head tube connector end.*

8. Remove the monocoil liner.

CAUTION: FLYING DIRT AND METAL PARTICLES can injure personnel and damage equipment.

- *Point gun liner only in a safe direction away from personnel and equipment when cleaning with compressed air.*

9. Blow out gun casing or liner with compressed air whenever the wire or liner is removed.
10. Slide the gun/feeder connector out of insulator to gain access to the rear centering sleeve setscrew (see Figure 2-1).
11. Loosen the setscrew.
12. When changing from 1/16, .068/.072, or 5/64 in. (1.6, 1.8, or 2.0 mm) to any other size wire, remove the rear centering sleeve.

    When changing to 1/16, .068/.072, or 5/64 in. (1.6, 1.8, or 2.0 mm) from any other size wire, insert the centering sleeve into the gun/feeder connector, rotate the sleeve until the notched portion lines up with the lubricator cup hole, and secure the setscrew.
13. Insert the new monocoil liner. 1/16, .068/.072, or 5/64 in. (1.6, 1.8, or 2.0 mm) liners must be inserted from the head tube connector end.
14. Reinstall the head tube.

IMPORTANT: *Ensure that the new monocoil liner butts against the stub liner in the head tube before securing the new liner.*

CAUTION: OVERTIGHTENING LINER SETSCREW will damage liner.

- *Do not overtighten liner setscrew.*

15. Tighten the monocoil liner setscrew.
16. Slide the gun/feeder connector into the insulator (see Figure 2-1).
17. Reinstall the lubricating cup.

IMPORTANT: *The new monocoil liner is longer than necessary. For 3/32 to 1/8 in. (2.4 to 3.2 mm) wire, cut the liner off 1/4 in. (6.4 mm) beyond the gun/feeder connector.*

18. Install the new outlet wire guide. For 1/16 to 5/64 in. (1.6 to 2.0 mm) wire, cut the liner off 1/16 in. (1.6 mm) beyond the wire guide.
19. Reposition hand guard, and tighten clamp securing it to the handle.
20. Reconnect power to all equipment and resume operation.

Available Wire Sizes

1.6 MM	1.8 MM	2.0 MM	2.4 MM	2.8 MM	3.2 MM
.063	.068/.072	.079	.094	.110	.126
1/16"	.068"/.072"	5/64"	3/32"	7/64"	1/8"

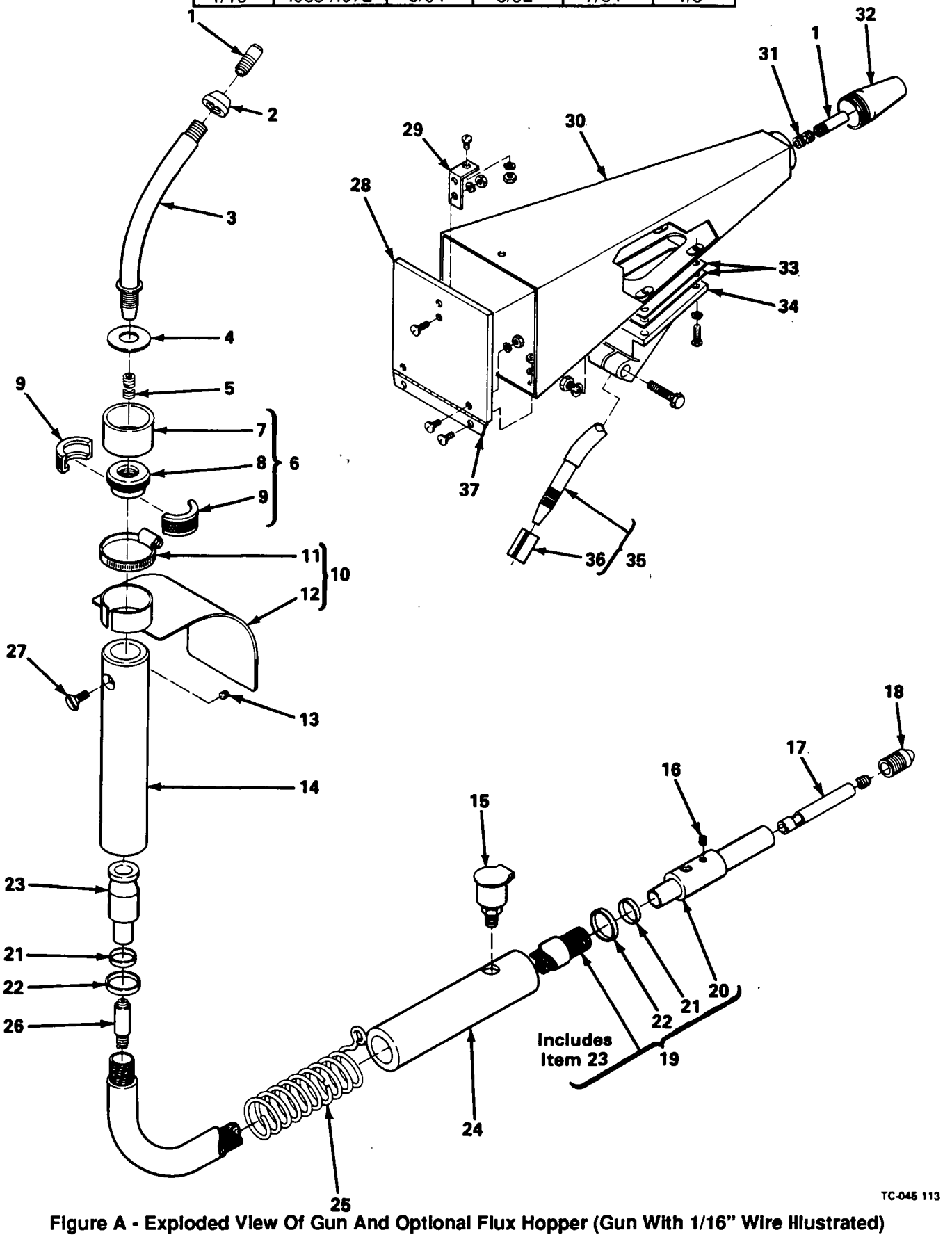


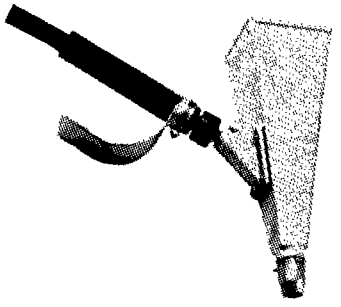
Figure A - Exploded View Of Gun And Optional Flux Hopper (Gun With 1/16" Wire Illustrated)

Item No.	Part No.	Description	Quantity
Figure A		**Exploded View Of Gun Assembly & Optional Flux Hopper**	
1	009 709	TUBE, contact 1/16 wire	1
1	090 922	TUBE, contact .068/.072 wire	1
1	052 055	TUBE, contact 5/64 wire	1
1	008 926	TUBE, contact 3/32 wire	1
1	008 925	TUBE, contact 7/64 wire	1
1	008 924	TUBE, contact 1/8 wire	1
2	+046 017	PROTECTOR, thread	1
3	+046 018	TUBE, head 60 deg	1
4	008 932	INSULATOR, handle	1
5	+008 931	LINER, monocoil 7-1/4 long	1
6	075 625	KIT, connector - head tube (consisting of)	1
7	075 855	· INSULATOR, nut	1
8	075 626	· NUT, brass	1
9	078 981	· RING-HALF, gun	2
10	+008 948	GUARD, w/clamp (consisting of)	1
11	010 860	· CLAMP, 13/16-1-3/4 clamp dia	1
12	008 928	· GUARD	1
13	602 177	SCREW, set - socket hd 1/4-20 x 1/4	1
14	075 628	HANDLE, gun	1
15	073 357	CUP, lubricator	1
16	605 789	SCREW, set - socket hd 10-24 x 1/4	1
17	079 856	SLEEVE, centering - monocoil	1
18	079 852	GUIDE, wire - outlet 1/16 & 5/64 wire	1
18	079 851	GUIDE, wire - outlet 3/32-1/8 wire	1
19	048 827	CABLE/CONDUIT, 10 ft (consisting of)	1
19	048 826	CABLE/CONDUIT, 15 ft (consisting of)	1
20	085 210	· ADAPTER, gun/feeder	1
21	004 733	· CLAMP, cable	2
22	004 732	· CLAMP, cable	2
23	004 729	· ADAPTER, head tube/power cable	1
24	075 644	INSULATOR, body - lubricator	1
25	095 949	SPRING, compression	1
26	009 624	LINER, monocoil 1/16-5/64 wire 10 ft	1
26	088 758	LINER, monocoil 3/32-1/8 wire 10 ft	1
26	009 625	LINER, monocoil 1/16-5/64 wire 15 ft	1
26	008 759	LINER, monocoil 3/32-1/8 wire 15 ft	1
27	078 894	SCREW, flat-hd 1/4-20 X 3/8	1
	♦052 789	FLUX HOPPER, hand-held (consisting of)	1
28	006 868	· COVER, flux hopper	1
29	006 861	· CLIP, spring - cover	1
30	006 870	· BODY, flux hopper	1
31	052 759	· LINER, monocoil 1/16-1/8 wire x 8-1/4	1
32	006 862	· NOZZLE, flux	1
33	006 865	· SHIM, torch - adapter (as req'd)	1
34	006 866	· ADAPTER, gun	1
35	052 808	· TUBE, head - curved (consisting of)	1
36	076 183	· · TUBE, fiber	1
37	006 863	· HINGE, cover	1
	+046 013	NOZZLE, screw 1-3/4 long	1
	+046 014	NOZZLE, screw 2-3/8 long	1
	♦085 210	ADAPTER, gun/feeder .045 wire	1
	♦076 123	COMPOUND, cable lubricant	1
	♦079 885	TRIGGER SWITCH, 10 ft	1
	♦079 854	TRIGGER SWITCH, 15 ft	1

♦Optional Equipment
+These items not included if unit was ordered with optional flux hopper factory installed.
BE SURE TO PROVIDE MODEL AND SERIAL NUMBER WHEN ORDERING REPLACEMENT PARTS.

CONTACT TUBES

Wire Size	Stock No.
1/16" (1. 6 mm)	**009 709**
.068/.072 (1.8 mm)	**090 922**
5/64" (2 mm)	**052 055**
3/32" (2.4 mm)	**008 926**
7/64" (2.8 mm)	**008 925**
1/8" (3.2 mm)	**008 924**



INSULATED WIRE GUIDES (Nozzles)
Stock No. **046 013**
1-3/4" (44 mm) long for 1-1/4" (32 mm) to 1-3/4" (44 mm) Electrical Stick-Out

Stock No. **046 014**
2-3/8" (6] mm) long for 2" (51 mm) to 2-1/2" (64 mm) Electrical Stick-Out

THREAD PROTECTOR (Standard) Stock No. **046 017**

REPLACEMENT LINERS

Wire Size	Stock No. 10ft. (3 m)	15 ft. (4.6 m)
1/16" (1.6 mm) and 5/64" (2 mm)	**009 624**	**009 625**
3/32" (2. 4mm) through 1/8" (3.2 mm)	**048 823**	**048 824**

HAND-HELD FLUX HOPPER
Stick No. **046 728** (Factory), **052 789** (Field)
For manual Submerged Arc applications. NOTE: The head tube is not threaded and will not accept the insulated wire guides or thread protector.

TRIGGER SWITCH
10' (3 m) Stock No. **079 855** 15' (4.6 m) Stock No. **079 854**
Includes cord and plug. Required when used with Swingarcs,™ PORTA-MIG,™ or the 50 Series feeders.

1 3/4" Insulated Wire Guide

2 3/8" Insulated Wire Guide